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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,458	01/04/2007	Vesa Myllymaki	0696-0228PUS1	1010
2292 7590 06/14/2011 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER QIAN, YUN				
ART UNIT 1732		PAPER NUMBER		
NOTIFICATION DATE 06/14/2011		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary**Application No.**

10/568,458

Applicant(s)

MYLLYMAKI ET AL.

Examiner

YUN QIAN

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,9,11,12,14-18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,9,11,12,14-18 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 21, 2010 has been entered.

Status of Claims

Claims 1, 3-6, 9, 11-12, 14-18, and 20 remain for examination. Claims 1, 9, 12, 16, 18 are amended. Claims 2, 7-8, 10, 13 and 19 have been canceled.

Previous Grounds of Rejection

Regarding claims 1-6, 12,14 and 19, the provisionally rejection on the ground of nonstatutory obviousness-type double patenting as being unpatentable over copending Application No.10/585,055 is withdrawn as claim 1 is amended to include the subject matter of claim 7.

Regarding claims 1-20, the rejection under 35 U.S.C. 103(a) as being unpatentable over Bergstrom et al. (US 4,000,032) in view of Swatloski et al. (WO 03/029329), in further view of Gutowski et al. PCT/AU01/00100 is withdrawn. Among them, claims 2, 7-8, 10, 13 and 19 have been canceled.

However, upon further consideration, a new ground(s) of rejection is made as follows.

New Grounds of Rejection

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3-6, 9, 11 and 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "the substantial absence of" cited in claims 1, 9, 12 and 16 are relative terms which render the claims indefinite. The term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite residual of water, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Appropriated corrections are required.

In addition, claim 9 reads like the pulping or defibering process is in ionic liquid, not that the lignocellulosic material is dissolved in ionic liquid. Clarification is required.

As such, the dependent claims 3-6, 11 and 17 are rejected for the reasons set forth above.

Claim 12 and 14-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the limitations of "lignin may be removed", it renders the claim indefinite. For purposes of examination, claim 12 is interpreted as "optionally removal the lignin". An appropriated correction is required.

As such, the dependent claims 14-15 are rejected for the reasons set forth above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swatloski et al. (WO 03/029329), and further in view of Luc et al. (IEC 0 [438650]: Reactivity of lignocellulosic biomass derivatives in ionic ligands, as cited on ISR).

Regarding claim 1, Swatloski et al. teaches a method for dissolving cellulose (any form that is amenable to being wet by a liquid including fibrous cellulose, wood pulp, linters, cotton balls and paper) in an ionic liquid absence of water via an admixing and microwave irradiation at <150 °C (page 18, and claims 1-3 and 6).

However, Swatloski et al. does not specifically disclose dissolving untreated lignocellulosic material as per applicant claim 1.

Luc et al. teaches the use of ionic liquids as novel solvents system for treatment of carbohydrate and lignin.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method for treatment cellulose of Swatloski et al. with the use of ionic liquids for treatment of lignin to obtain the invention as specified in the claim 1, motivated by the fact that the use of ionic liquids as replacements for conventional organic solvents in chemical, biochemical and separation processes prevents pollution and waste production, and utilizes renewable resources (Swatloski et al. Page 3 and page 29). The economic significance of lignin materials is well recognized as a good raw material for many applications. Based on the suggestion of Luc et al. to use ionic liquids as solvent for lignin and study of reactivity of lignocellulosic

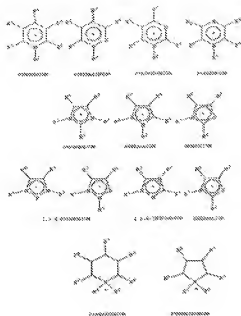
material in ionic liquids, it would have been obvious to one of ordinary skill in the art to try to method of Swatloski et al. on untreated straw or wood (lignocellulosic material) as claimed and expect success in dissolving the lignocellulosic material.

Since both Swatloski et al. and Luc et al. teach the use of ionic liquids for treatment of polysaccharides, one would have a reasonable expectation of success.

Regarding claim 3, although, both Swatloski et al. and Luc et al. are silent to the reaction pressure, this is considered to be obvious as it is well within the level of one of ordinary in the art at the time of invention, to determine the reaction kinetics through routine experimentation in the art, in an effort to optimize the reaction conditions including the pressure.

Regarding claim 4, the ionic liquid solvent taught by Swatloski et al. is molten at a temperature of $<150^{\circ}\text{C}$ (claim 6). Therefore, the combined references are encompassed by the recited claim.

Regarding claims 5-6, the cation of the ionic liquid solvent taught by Swatloski et al. is selected from group consisting of:



The cation comprises imidazolium and the anion is halogen. It meets the claimed limitations (page 5, and claim 55).

Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swatloski et al. (WO 03/029329), and further in view of Luc et al. (IEC 0 [438650]: Reactivity of lignocellulosic biomass derivatives in ionic ligands, as cited on ISR).

Regarding claim 9, Swatloski et al. teaches a method for dissolving cellulose (any form that is amenable to being wet by a liquid including fibrous cellulose, wood pulp, linters, cotton balls and paper) in an ionic liquid substantially free of water via an admixing and microwave irradiation at <150 °C (page 18, and claims 1-3 and 6). Cellulose displays high solubility in the ionic liquid about 10-25%wt (page 19).

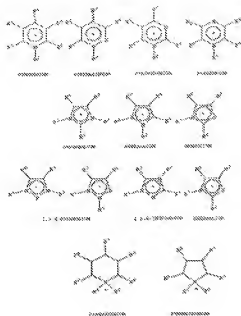
However, Swatloski et al. does not specifically disclose untreated lignocellulosic material as per applicant claim 9.

Luc et al. teaches the use of ionic liquids as novel solvents system for treatment of carbohydrate and lignin.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method for treatment cellulose of Swatloski et al. with the use of ionic liquids for treatment of lignin to obtain the invention as specified in the claim 9, motivated by the fact that the use of ionic liquids as replacements for conventional organic solvents in chemical, biochemical and separation processes prevents pollution and waste production, and utilizes renewable resources (Swatloski et al. Page 3 and page 29). The economic significance of lignin materials is well recognized as a good raw material for many applications. Based on the suggestion of Luc et al. to use ionic liquids as solvent for lignin and study of reactivity of lignocellulosic material in ionic liquids, it would have been obvious to one of ordinary skill in the art to try to method of Swatloski et al. on untreated straw or wood (lignocellulosic material) as claimed and expect success in dissolving the lignocellulosic material.

Since both Swatloski et al. and Luc et al. teach the use of ionic liquids for treatment of polysaccharides, one would have a reasonable expectation of success.

Regarding claim 11, the cation of the ionic liquid solvent taught by Swatloski et al. is selected from group consisting of:



The cation comprises imidazolium and the anion is halogen. It meets the claimed limitations (page 5, and claim 55).

Claims 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swatloski et al. (WO 03/029329), and further in view of Luc et al. (IEC 0 [438650]: Reactivity of lignocellulosic biomass derivatives in ionic ligands, as cited on ISR).

Regarding claims 12 and 14, the process for dissolving and regenerating cellulose taught by Swatloski et al. comprises steps of (a) dissolving cellulose in an ionic liquid solvent in the substantial absence of water under microwave irradiation at about 120 °C, (b) forming solid and liquid phases (precipitating the cellulose) by adding a liquid non-solvent such as water, alcohol or ether, (c) collecting the formed cellulose (Example 3, page 24, and claims 1-3 and 52-60).

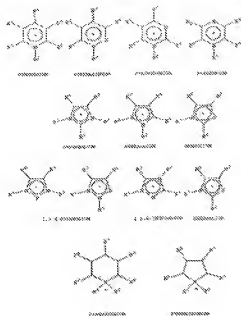
However, Swatloski et al. does not specifically disclose untreated lignocellulosic material as per applicant claims 12 and 14.

Luc et al. teaches the use of ionic liquids as novel solvents system for treatment of carbohydrate and lignin.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method for treatment cellulose of Swatloski et al. with the use of ionic liquids for treatment of lignin to obtain the invention as specified in the claims 12 and 14, motivated by the fact that the use of ionic liquids as replacements for conventional organic solvents in chemical, biochemical and separation processes prevents pollution and waste production, and utilizes renewable resources (Swatloski et al. Page 3 and page 29). The economic significance of lignin materials is well recognized as a good raw material for many applications. Based on the suggestion of Luc et al. to use ionic liquids as solvent for lignin and study of reactivity of lignocellulosic material in ionic liquids, it would have been obvious to one of ordinary skill in the art to try to method of Swatloski et al. on untreated straw or wood (lignocellulosic material) as claimed and expect success in dissolving the lignocellulosic material.

Since both Swatloski et al. and Luc et al. teach the use of ionic liquids for treatment of polysaccharides, one would have a reasonable expectation of success.

Regarding claim 15, the cation of the ionic liquid solvent taught by Swatloski et al. is selected from group consisting of:



The cation comprises imidazolium and the anion is halogen. It meets the claimed limitations (page 5, and claim 55).

Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swatloski et al. (WO 03/029329), and further in view of Luc et al. (IEC 0 [438650]: Reactivity of lignocellulosic biomass derivatives in ionic ligands, as cited on ISR).

Regarding claim 16, the process for dissolving and regenerating cellulose taught by Swatloski et al. comprises steps of (a) dissolving cellulose in an ionic liquid solvent in the substantial absence of water under microwave irradiation at about 120 °C, (b) forming solid and liquid phases (precipitating the cellulose, corresponding to applicants' extraction/separation) by adding a liquid non-solvent such as water, alcohol or ether, (c) collecting the formed cellulose (Example 3, page 24, and claims 1-3 and 52-60).

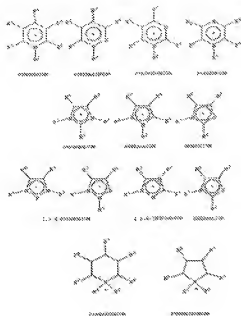
However, Swatloski et al. does not specifically disclose untreated lignocellulosic material as per applicant claim 16.

Luc et al. teaches the use of ionic liquids as novel solvents system for treatment of carbohydrate and lignin.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method for treatment cellulose of Swatloski et al. with the use of ionic liquids for treatment of lignin to obtain the invention as specified in the claim 16, motivated by the fact that the use of ionic liquids as replacements for conventional organic solvents in chemical, biochemical and separation processes prevents pollution and waste production, and utilizes renewable resources (Swatloski et al. Page 3 and page 29). The economic significance of lignin materials is well recognized as a good raw material for many applications. Based on the suggestion of Luc et al. to use ionic liquids as solvent for lignin and study of reactivity of lignocellulosic material in ionic liquids, it would have been obvious to one of ordinary skill in the art to try to method of Swatloski et al. on untreated straw or wood (lignocellulosic material) as claimed and expect success in dissolving the lignocellulosic material.

Since both Swatloski et al. and Luc et al. teach the use of ionic liquids for treatment of polysaccharides, one would have a reasonable expectation of success.

Regarding claim 17, the cation of the ionic liquid solvent taught by Swatloski et al. is selected from group consisting of:



The cation comprises imidazolium and the anion is halogen. It meets the claimed limitations (page 5, and claim 55).

Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swatloski et al. (WO 03/029329), and further in view of Luc et al. (IEC 0 [438650]: Reactivity of lignocellulosic biomass derivatives in ionic ligands, as cited on ISR).

Regarding claim 18, the process for dissolving and regenerating cellulose taught by Swatloski et al. comprises steps of (a) dissolving cellulose in an ionic liquid solvent in the substantial absence of water under microwave irradiation at about 120 °C, (b) forming solid and liquid phases (precipitating the cellulose, corresponding to applicants' separation) by adding a liquid non-solvent such as water, alcohol or ether, (c) collecting the formed cellulose (Example 3, page 24, and claims 1-3 and 52-60).

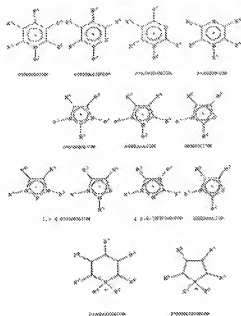
However, Swatloski et al. does not specifically disclose untreated lignocellulosic material as per applicant claim 18.

Luc et al. teaches the use of ionic liquids as novel solvents system for treatment of carbohydrate and lignin.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method for treatment cellulose of Swatloski et al. with the use of ionic liquids for treatment of lignin to obtain the invention as specified in the claim 18, motivated by the fact that the use of ionic liquids as replacements for conventional organic solvents in chemical, biochemical and separation processes prevents pollution and waste production, and utilizes renewable resources (Swatloski et al. Page 3 and page 29). The economic significance of lignin materials is well recognized as a good raw material for many applications. Based on the suggestion of Luc et al. to use ionic liquids as solvent for lignin and study of reactivity of lignocellulosic material in ionic liquids, it would have been obvious to one of ordinary skill in the art to try to method of Swatloski et al. on untreated straw or wood (lignocellulosic material) as claimed and expect success in dissolving the lignocellulosic material.

Since both Swatloski et al. and Luc et al. teach the use of ionic liquids for treatment of polysaccharides, one would have a reasonable expectation of success.

Regarding claim 20, the cation of the ionic liquid solvent taught by Swatloski et al. is selected from group consisting of:



Response to Arguments

With regards to the previous Grounds of Rejection

Conclusion

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YUN QIAN/
Examiner, Art Unit 1732

June 8, 2011

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1732